



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/696,521 | 10/28/2003 | George Hsieh | 042390P10939D | 9073 |

7590 07/01/2004

Michael A. Bernadicou
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025

EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1751

DATE MAILED: 07/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/696,521

Applicant(s)

HSIEH ET AL.

Examiner

Kallambella Vijayakumar

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 10-28-2003
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 12-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-15 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 16, 21 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>1</u> . | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

- This application is a divisional of copending application, Sl. No. 10,039,300 filed June 02, 2002. Claims 12-22 are pending with this application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

- Claims 12, 18-20 rejected under 35 U.S.C. 102(b) as being anticipated by Jiang et al (US Patent 6,011,307).

Jiang-301 teach coating compositions containing dispersion of ferromagnetic particles in a viscous binder matrix of polymer/resin such as either a thermosetting or a thermoplastic, and curing of the composition in the process of forming conductive interconnection between electronic components. Jiang et al further disclose depositing the coating composition on the first electronic component by screen-printing, placing the second electronic component over the first electronic component, aligning them in position, apply the magnetic field to align the

ferromagnetic particles forming conductive path and cure the polymer/resin while the magnetic field is being applied, thus forming conductive path and interconnection between the two components, and this would meet the limitations of instant claims 12 and 20. (Abstract, Col-2, Lines: 52-68; Col-3, Lines 25-65; Col-5, Lines: 45-50; Col-9, Lines: 41-56). Further, either varying the temperature or treating the composition with a radiation for solidifying/curing the polymer would be anticipated. All the limitations of the instant claim are met.

The reference is anticipatory.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

- Claims 12-15, 17-20 rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang et al (US Patent 6,011,307) in view of Giraud et al (US Patent 5,846,854) or Baldwin et al (US Patent 5,946,791) or Jin et al (US Patent 5,618,189) or Weld et al (US Patent 5,773,322).

The disclosure by Jiang-301 on the composition and forming of the coating/adhesive material, depositing it on a substrate by screen-printing and method of forming the conductive interconnection between two electronic components is set forth as above under 35 USC 102(b).

Jiang et al do not teach or suggestive of using of a squeegee and screen in screen printing or testing of the conductive paths while fabricating the interconnection.

In the related art, Giraud-854 teach the benefits of depositing inks forming conductive tracings on a substrate by screen-printing of conductive inks using a squeegee and pre-coating the substrate prior to conductive coating (Col-6, Lines: 41-48; Col-10, Lines: 31-40).

In the analogous art, Baldwin-791 teach the fabrication of interconnection between the two electronic component using magnetic particles, that are the same conductive/magnetic particles being claimed by applicants in the instant claim-12 and testing of the conductive paths in the process of fabrication as a quality control step and its advantages in minimizing the number of defects (Abstract, Col-2, Lines: 39-54, Col-3, Lines: 19-30).

In the analogous art Jin-189 teach making the interconnect between the two components using a composition comprising of a polymer and magnetic particles, by solidifying and curing the mixture while exposing the mixture to the magnetic field (Col-5, Lines: 6-28).

In the analogous field Weld-332 teaches curing of polymer mixed with conductive particles of cobalt/iron (magnetic particles) by subjecting the mixture to magnetic field as the polymer is cured forming conductive paths in an interconnect.

It would have been obvious to a person of ordinary skill in the art to make modifications to the method of Jiang et al on the formation of interconnections having conductive paths formed by the aligned conductive magnetic particles in a polymer/resin dispersion and further improve with the teachings of Baldwin et al by optionally incorporating the testing of the conductive paths to benefit from the reduced defective units, because Baldwin teaches these aspects using magnetic particles in the analogous art, and/or apply the magnetic field while the polymer is cured to benefit from secured conductive paths per the teachings of either Jin or Weld, because either of them singly teach these benefits in the analogous art, and cure the polymer either by varying the temperature or by UV irradiation based on the polymer/resin used as a binder in the composition, that was customarily practiced at the time the invention was done, and/or optionally use the squeegee in a screen printing of the coating material and pre-coating the substrate to benefit from precise deposition of the coating material with ease per the teachings of Giraud et al, because Giraud et al teach these aspects in a related art pertinent to the invention, and all the teachings are in the analogous and pertinent arts to the instant invention by the applicants, and with the expectation of reasonable success in obviously arriving at the limitations of the instant claims by the applicants.

Allowable Subject Matter

- Claims 16, 21 and 22 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
- The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach or suggestive of pre-coating the substrate with the coating material, or a applying the magnetic field from a metallic surface or the conductive/magnetic particles meeting the limitations of the instant claims by the applicants.

Conclusion

- Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on M-Th, 07.00 - 16.30 hrs, Alt. Fri: 07.00-15.30 hrs.
- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMV
June 26, 2004


Mark Kopec
Primary Examiner